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Decision Support Tools for Stockpile Analysis

(unclassified summary)

Crystal Dale and Kris Kern,
Systems Design & Analysis; NEN-5

May 24, 2022

Supporting Executive-Level Stockpile Planning and Decision Making

- The annual stockpile and weapons complex planning process is a highly interdependent, complex system of analyses and decisions that involve multiple sites and stakeholders.
  - Decisions are often made with incomplete or anecdotal information.
- Our executive-level decision support tools are designed to inform senior leadership at LANL and across the Weapons Complex.
  - Portable (excel based), rapidly modifiable to accommodate changing situations.
  - Easily understood, with clear success/failure metrics.
  - Rapid, flexible scenario generation to meet the needs of a broad range of stakeholders.
- Our tools are requirements-based and verified by peers at LANL, LLNL, production agencies, and NNSA.
  - Stockpile program of record from the Planning and Program Directive (P&PD).
  - Supply calculations reflect the latest production estimates, including infrastructure investment timing and resulting capacity.

Challenge: Translating complexity, simply, without loss of integrity.

Impacting Ongoing Programs and Building Relationships

- Impacting Ongoing Programs
  - The tritium supply and demand model has been briefed to NA-10 and was used to support the 2018 JASON review of the tritium program. As a result, program plans were modified to ensure future tritium supply is sufficient to meet stockpile needs.
  - Requirements Planning Document (RPD) Assessment: Our team has supported joint NNSA and USSTRATCOM engagement for future stockpile planning. LANL tools influenced decisions for future stockpile modernization.
  - Through engagement with USSTRATCOM, the pit planning model was used to inform the 2022 Nuclear Posture Review.
  - The pit model has been modified to include production capacity estimates based on an ongoing Design for Manufacture (DFM) LDRD.
- Building Relationships Across the Nuclear Weapons Complex
  - Our tools have been used to enhance collaboration and common understanding between the two physics design labs through demonstration at quarterly LANL/LLNL senior leadership meetings.
  - The radiation case production planning tool has been recognized by LANL and NNSA leadership for its role in promoting a common understanding of case production with LANL, LLNL, and Y12.
  - The RPD Explorer and P&PD Explorer have been shared with DoD and NNSA.